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A Physiological Approach to the Analysis of Reading Disabilities

By EMMETT ALBERT BETTS

[*Continued from the September 18 Issue*]

CHILDREN read with their eyes; faultless sensation must precede accurate perception. The mind can interpret only the impressions it receives. This truism has been too frequently overlooked in our educational-research meanderings. Maturation is the chief factor contributing to reading ability; normal visual sensation and perception are also prime requisites. Before entrance to the first grade every child should be thoroughly examined by a competent eye-specialist. A certificate of visual readiness to read should be required. The number of visual aberrations among both able and disabled readers makes this a mandatory policy for adoption by all school administrators.

The binocular co-ordination required in reading was not subject to scientific study until the development of the material on "visual sensation and perception" and "oculomotor habits" which is described herein. The apparent need for more research is upon the deviations or regressions, faulty eye co-ordination, of one eye during the binocular reading process. In general, the results of our researches have confirmed our suspicions regarding the factor of binocular co-ordination.

If we were a one-eyed race, our reading difficulties would probably be few. A one-eyed person with normal acuity, or sharpness of vision, has little or no difficulty with the confusion of letters and words. A two-eyed individual presents a different problem; not only must the dominant eye fix on a word or phrase, but its companion also must fix on the same target simultaneously and with as much precision and speed. In addition to this, the mind must fuse or combine the right-eye and

left-eye images into one for normal interpretation. Many of our reading problems are directly traceable to a lack of co-ordination between the two eyes and to the probable failure of the mind to combine the right-eye and left-eye pictures for correct interpretation.

The Betts Ready to Read Tests are devised to appraise the co-ordinate action of the eyes.[8] The chief factors contributing to the validity of the tests of visual sensation and perception are: First, each eye is tested independently while both eyes are seeing. This is accomplished by a dissociation of the eyes. The eye which is not being tested can look at a blank surface, while the seeing eye is being tested without the subject's awareness of the phenomenon. Second, binocular co-ordination which is essential to rapid and efficient reading habits is appraised. Muscle balance, near-point and far-point fusion, and stereopsis level are tested. Third, binocular acuity, as well as the acuity of each eye, is tested.

The Keystone Ophthalmic Telebinocular is adapted ideally for binocular tests of visual functions. With this instrument and accompanying slides, both eyes function simultaneously while the vision of each eye is being studied. These simple tests provide practically the only rational means of measuring the binocular relationship. The simple construction of this instrument separates the fields of vision and permits the left eye to see only its half of the slide and the right eye to see only its half of the slide. Through the process called fusion, the left-eye image and the right-eye image are combined into one.

The distance between the eyes of the subject, the interpupillary distance, is compensated for by the optical construction of the instrument. This construction of the telebinocular provides an artificial set-up whereby measurements can be made at reading-distance equivalents ranging from 12 inches to infinity (ordinarily infinity is considered 20 feet or beyond). The placing of the slide holder at these distance-equivalent marks on the top of the shaft accomplishes this result.

The same tests used for the analysis of visual sensation and perception on the kindergarten level are also used on all other age-levels. The need for these tests was determined by an analysis of doctors' reports on disabled readers referred through

[8] *See* Betts, Emmett Albert. "Manual of Directions for Ready to Read Tests." Meadville, Pennsylvania: Keystone View Company, 1934.

the medical department.[4] Approximately 90 per cent of the non-readers and severely retarded readers have been found to require medical attention before receiving pedagogical help. This conclusion has not been reached by other investigators[5] because convenient tests of binocular co-ordination have not been available for the researches. Refractive errors have been the chief consideration. One can only speculate on the number of clinical reading cases which might have been saved the embarassment of failure; however, the need for preventative measures probably cannot be overemphasized. Our own and other researches have made us sensitive to the necessity of exploring seven visual items: refractive errors, muscle balance, size and shape of ocular images,[6] visual fusion, monocular and binocular eye-movements, interpupillary distance (P. D.), and visual imagery (after, eidetic,[7] and memory). Unrefined indexes to refractive errors (hypermetropia, myopia, astigmatism), muscle imbalance, fusion, and visual acuity may be secured by means of the telebinocular tests in six to fifteen minutes time. Monocular and binocular regression slides are also used in conjunction with the same instrument.

THE test of lateral imbalance was prepared on a standard Keystone stereoscopic slide. Before the right eye is an arrow; before the left eye, a horizontal scale which is 70 millimeters long. Figures, numbered consecutively from 1 to 15 appear across the top edge of the scale, the first number is exactly 45 millimeters from the arrow and the last number, 15, is exactly 115 millimeters from the arrow. Normal binocular vision will permit the subject to superimpose the two images so that they appear as one. The subject is asked, "To what number does the arrow point." For subjects who cannot read, the examiner slides a steel-topped pointer across the picture before the left eye saying, "Say 'stop' when the pointer touches the middle of the arrow." When the slide is at a distance

[4] Dr. Justin A. Garvin, head of Shaker Heights Medical Staff, has made possible the development of this phase of the program.

[5] Kempf, Grover; Jarman, Bernard L.; and Collins, Selwyn. *A Special Study of the Vision of School Children.* Washington: Government Printing Office, 1929. (United States Health Service, Public Health Reports, Reprint No. 1235).

[6] Ames, A.; Ogle, Kenneth N.; and Gliddon, Gordon H. "Corresponding Retinal Points: the Horopter and Size and Shape of Ocular Images," *Journal of the Optical Society of America,* XXII (October and November, 1932), pp. 538–632.

[7] Kluver, Heinrick. *The Eidetic Child: a Handbook of Psychology.* Worcester, Massachusetts: Clark University Press, 1931.

equivalent of 13 inches from the eyes of the subject, the average first-grade entrant will report the arrow to be pointing to 4.5. This means that the visual axis of the eyes are 62.5 millimeters apart. If such a subject reports the arrow to be pointing at a number less than 3.5, he is overconverging; if to a number greater than 5.5 the eyes deviate outward.

In Table II the data are presented for the lateral-imbalance test. As just stated, the purpose of this test is to determine the tendency of the eyes to turn in or out or to remain normally parallel. In other words, it determines the tone of the extrinsic muscles. If there is a lateral-imbalance condition, the visual

TABLE II

SUMMARY OF LATERAL IMBALANCE DATA FOR FIRST-GRADE ENTRANTS

Class Interval	3 Diopters (Equivalent of 13 inches)	2 Diopters (Equivalent of 20 inches)	1 Diopter (Equivalent of 40 inches)	.00 (Equivalent of Infinity)
(1)	(2)	(3)	(4)	(5)
12–12.75	.....	.....	.....	2
11–11.75	.....	.....	.....	9
10–10.75	.....	.....	4	31
9– 9.75	1	.....	12	64
8– 8.75	0	4	39	50
7– 7.75	1	20	90	19
6– 6.75	9	65	29	12
5– 5.75	52	68	10	2
4– 4.75	87	29	6	1
3– 3.75	35	2	.....	.....
2– 2.75	3	2	.....	.....
1– 1.75	2	.....	.....	.....
Total	190	190	190	190

axes of the eyes deviate outward (called exophoria) or inward (called esophoria). Readings were taken with the subject looking at the equivalent of four different distances: infinity, 40 inches, 20 inches, and 13 inches. As the subject looks at an object nearer than infinity (usually considered as 20 feet or beyond), the eyes automatically converge or turn in.

The units of the class interval (*see* Table II) were taken from the test. The smaller numbers indicate the inward position of the eyes; the larger numbers, a tendency outward. On the scale before the right eye, the distance between each number is exactly 5 millimeters. Since the dots on the scale are

EDITOR'S NOTE.–One-quarter and its multiples will be expressed in hundredths in the text of this article and in the table because of the printing difficulties of using fractions.

placed 2.5 millimeters apart, it was convenient to record the readings in units of ¼. In Column 2 it will be noted that for 87 cases, readings of 4 to 4.75 were recorded. This includes the cases reporting the arrow to fall at 4.0, 4.25, 4.5, and 4.75. The data for the other class intervals are reported in like manner. Approximately 10 per cent of the cases showed extreme deviations which would undoubtedly make binocular co-ordination difficult, if not impossible. The validity of this statement can be definitely determined by means of other tests in the battery.

The condition in which one of the eyes deviates upward is called hyperphoria or vertical imbalance. The purpose of such a test is to determine whether or not the eyes function in the same horizontal plane. In order to analyze this condition, a test of vertical imbalance was prepared on a standard Keystone stereoscopic slide. A horizontal line was drawn on the right-eye half of the slide, and a ball was placed before the left eye. A subject with normal vertical eye-muscle balance projects the line upon the center meridian of the ball. The radius of the ball is equal to the amount of tolerance; therefore, if the line falls upon any part of the ball, the condition is acceptable.

The summary of the data for vertical imbalance presented by a group of first-grade entrants follows:

Response	Number of Pupils
Suppression, etc.	2
Right-eye imbalance	2
Left-eye imbalance	2
Normal balance	188
Total	194

Of 194 cases tested for vertical imbalance, 4 evidenced an imbalance, and 2 could not be tested because they either suppressed the vision in one eye or a pathological condition existed.

THE purpose of the stereopsis test is the measurement of the individual's level of depth perception. Although stereopsis (depth perception) is not required for reading on the usual flat surface, the degree of fusion required to pass this test is essential to rapid reading on the usual flat surface. The degree of fusion required to pass this test is essential to rapid reading habits. Severely disabled readers rarely go beyond the 60–per cent level on this test. Wells states, "When the facts are known,

it is quite possible that visual tests will not stop with measuring the acuity of each eye and testing the color sense, but that a certain standard of stereopsis will be required."[8]

Man is probably the only animal with the degree of binocular co-ordination which permits depth perception. Without binocular co-ordination of high degree, true depth perception is not possible. This test, therefore, measures the co-ordination level of the two eyes. A summary of the data for stereopsis found in a group of first-grade entrants is given here:

Response in Percentage of Stereopsis	Number of Pupils	Response in Percentage of Stereopsis	Number of Pupils
0	5	60	18
10	4	70	5
20	2	80	3
30	0	90	25
40	4	100	120
50	4	Total	190

One hundred forty-five of the 190 cases tested for stereopsis (depth perception) were normal; that is, they had from 90 to 100 per cent stereopsis on the test used. A high degree of binocular co-ordination is required to pass this test.

In addition to the determination of the subject's level of depth perception (stereopsis) two tests of fusion (*see* Table III) were made—one for reading distance and one for seeing at 40 inches. Normal reading or seeing of fine detail is accomplished by one small part of the retina called the macula, the most highly sensitive area of the retina. Both the right and left eye have macular areas. In order to fuse two images into one, it is necessary for them to fall upon corresponding parts of the retina of each eye; that is, both eyes must be pointed toward the object of regard. This is achieved by the desire to fuse and the subsequent reflex action of convergence (the turning-in of the visual axes of the eyes).

The test for far-point fusion is used to appraise the individual's fusion power of macular-sized (letter-sized) images, or single binocular vision for distance. This is an important test for disabled readers.

The test for near-point provides an index to the individual's fusion ability at reading distance. The time required by the

[8] Wells, David W. *The Stereoscope in Ophthalmology.* Boston: E. F. Mahady Company, 1926, p. 14.

subject to fuse provides an important clue to his inability to read rapidly and efficiently. When the visual acuity in each eye is normal, a high level of binocular single vision is essential for rapid perception during the fixations or pauses of the mechanical reading process. Hence, this test provides a good

TABLE III

SUMMARY OF DATA FOR FUSION OF FIRST-GRADE ENTRANTS

Response	Near Point	Far Point
(1)	(2)	(3)
Monocular vision (no fusion)	1	1
Suppression, then slow fusion	1	1
Gross binocular vision (no fusion)	15	9
Slow fusion	9	15
Normal fusion	164	164
Total	190	190

TABLE IV

SUMMARY OF DATA FOR THE VISUAL ACUITY OF FIRST-GRADE ENTRANTS

Percentage of Acuity	Binocular Acuity	Left-Eye Acuity	Right-Eye Acuity
(1)	(2)	(3)	(4)
110	1	1	3
105	7	6	5
100	120	99	116
90	59	69	51
80	6	11	8
70	1	5	2
60	0	3	6
20	0	0	2
10	0	0	1
Total	194	194	194

index to the subject's ocular reflexes at approximately normal reading distance.

Only 86 per cent of the 190 first-grade entrants evidenced normal fusion speed and power. The remainder had either no fusion power or sluggish fusion.

Tests of the visual acuity of the eyes functioning together as well as independently are administered quickly and easily. The data for 194 first-grade entrants are exhibited in Table IV.

The tests for myopia (near-sightedness), hypermetropia (far-sightedness), and astigmatism are also made by means of

the Keystone Opthalmic Telebinocular. Seven of the cases could not be reliably tested, therefore, the data on them were questionable.

A summary of the data gathered regarding ametropia[9] found among 190 first-grade entrants follows:

Response	Number of Pupils
Normal	30
Questionable	7
Hypermetropia O.U. (Both)	80
Hypermetropia O.D. (Right)	1
Hypermetropia O.D. (Left)	5
Total	86
Myopia O.U. (Both)	6
Myopia O.D. (Right)	2
Myopia O.S. (Left)	2
Total	10
Astigmatism O.U. (Both)	67
Astigmatism O.D. (Right)	25
Astigmatism O.S. (Left)	12
Total	104

Eighty-six of the 190 first-grade entrants tested showed varying amounts of hypermetropia. This condition is not alarming, for children are normally far-sighted. It is important, however, in that the initial learning-to-read period should probably be postponed.

Some of the problem cases require little pedagogical help after the difficulties are corrected by means of glasses or eye-training exercises, or both. For others, considerable retraining and first teaching with special methods are necessary to develop even the lowest level of reading habits. The following is the doctor's report for a sixth-grade girl who had a tendency to letter reversals:

> I found without correction Nancy has an esophoria of four degrees for distance and one degree for her near point. Under a cyclopegic she has a moderate error of compound hyperopic astigmatism. I prescribed a correction for the astigmatism and believe this should correct her sluggish reading and spelling.

Following this, the child appeared to have renewed interest in her work, which proved itself at the next testing period.

Approximately 90 per cent of the severely disabled readers

[9] A variation of .50 diopters of tolerance allowed.

are visually characterized by faulty binocular co-ordination and astigmatism. Incidental to these characteristics, about 10 per cent of them have a low depth-perception level (stereopsis). So far all good readers with binocular vision have passed the test for stereopsis. Although stereopsis itself is not essential for the formation of good reading habits, the factors involved do apparently contribute to reading success.

Far-sightedness (hypermetropia) or hyperopic astigmatism is frequently found among six-year-olds. Some cases "grow out of" far-sightedness. Others require a temporary or permanent correction in order to learn to read. Besides failing to pass the hypermetropia test, such a child will usually overconverge on the muscle-balance test and often pass the acuity test with a superior rating.

A SERIES of tests developed for use in the Keystone Opthalmic Telebinocular has been prepared for the study of the subject's habits of perception and binocular reading tendencies. In addition to this, these tests often are the basis for the determination of the remedial reading needed. Binocular single vision is essential to normal performance. The size of the type on these slides when viewed through the lens system of the instrument is magnified to the approximate equivalent of 18-point type on the first series and 14-point type on the others.

The reading involved in the slides of Series 1 and 2 requires gross binocular vision only; of Series 3, superimposition (the image before each eye is fused without the depth perception); and of Series 4, stereopsis (depth perception—a high degree of fusion). The fourth series capitalizes on the fusion function to insure eye co-ordination during the reading fixations; that is, depth perception is possible only when the two eyes are working together. The tests in each series are graded.

The auditory characteristics of the poor reader often are fruitful sources for research. Such factors are probably more highly related to spelling and pronunciation. Obviously, no analysis of the auditory functions should be terminated with the testing of auditory acuity. In the Shaker Heights Clinic, tests of auditory span, auditory fusion, and auditory discrimination have been developed and are used as a part of the routine for the most serious problem cases. The Seashore Tests of Music Talent can also be profitably used. From these tests, we are

led to suspect that many children who do not profit by phonic methods have a narrow auditory frequency range.

An analysis of the kinaesthetic difficulties is made incidental to the other tests. Faulty eye co-ordination, speech defects, and handwriting difficulties appear to contribute to certain reading handicaps. The oculo-photometer, developed by J. Y. Taylor[10] is used to photograph the movements of both eyes during reading. This is the only convenient instrument available for the recording of binocular movements during reading. The findings can be explained in terms of our tests of "visual and sensation perception" and "oculomotor and perception habits."

Manuscript writing should be used with such children as well as with sight-saving classes. There should be more research on this phase of the problem.

CAREFUL research workers have debated over their findings regarding eye-hand relationships and their bearings on reading disabilities. Investigators have recently concluded that as many reading disabilities may be found among right-handed children as among left-handed children. It is, however, the opinion of the writer that the problem cannot be dismissed so summarily. In the light of the data here presented, the relation of dominance to binocular co-ordination must be considered from a new standpoint.

Many of the tests for ocular dominance are variations of a technique which compels the average subject psychologically to suppress, block, or ignore the vision in one eye in order to "sight." The average person can be caused to suppress the vision in either eye; hence, inconsistent results are certain. There is also considerable variation due to the technique used. Probably the safest procedure is the determination of composite scores for left-eyed and for right-eyed responses and the establishment of an eyedness ratio. The manoptoscope, mailing tube, peephole, and light tests have proved to be valuable for establishing an ocular dominance ratio.

Hand preference has proved to be specialized according to the nature of the task; therefore, we require the child to use the right hand for writing only when there is sufficient evidence from the tests which involve the items in question. In other words, the hand preference for writing should be determined

[10] Educational Laboratories, Brownwood, Texas.

largely by means of pencil-and-paper tests. A tapping test and two pencil and paper tests making *o*'s and *x*'s are used for the determination of hand preference for writing activities.[11]

Poor vocabulary and a foreign language sometimes contribute to the reading teacher's problems. In such cases the remedial measures are more easily prescribed.

It is likely that certain behavior problems might arise from a reading or spelling disability, but few reading difficulties result from poor social adjustments. Many children dislike reading for reasons unknown to them. An analysis of their troubles frequently reveals a physiological cause. On the emotional phase, a plea should be made for materials which can be made of interest to the older child with "primer" reading ability. The problem of motivating the work for these children is a real one. Faulty teaching techniques and the lack of a consistent program of reading instruction probably account for some reading difficulties.

External or environmental factors, also outside the pupil's control, add to his dilemma. Among these items may be noted irregularity of attendance, frequent change of schools, lighting, size and width of type, and school administrative policies relative to standard of reading in the primary grades. The odds appear to be against a child who frequently transfers from one school to another during the primary years. A survey of classroom lighting by means of a light meter frequently shows many children working under five foot-candles of light which is far below any reasonable standard. Additional research will probably make evident the necessity of increasing the age-limit for entrance into the first grade where reading activities are held at a premium. Introspective reports show that many six-year-old children cannot discriminate between the fine lines in the *c*'s and *o*'s used in printing reading materials. In one instance, a child could read twenty words per minute faster in a sight-saving book than in a typical school reader.

Our present program includes the study of monocular regressions and various types of imagery. Remedial materials built in the light of these data are also in the process of development. New instruments are being developed for the study of

[11] Crider, Blake. "Ocular Dominance: Its Nature, Measurement, and Development," 1934. An unpublished Doctor's thesis on file in the library of Western Reserve University.

delayed perception, monocular regressions during the binocular reading process, and ocular dominance.

At least two levels of readiness to read should be studied. The first level is characterized by psychological readiness. On this level the child can be caused to want to learn to read by a series of reading-readiness activities. Also, he may be able to discriminate between word configurations. Nevertheless, a child may be psychologically ready to read and not meet the second level, the physiological requirements. The essentials here are normal visual acuity and binocular co-ordination. Given normal visual acuity, that is, an absence of a pathological condition or a refractive error, the subject must have the power to maintain his binocular co-ordination during the entire period of reading. Interrelated with these two levels are maturation factors such as auditory span and visual span.

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Professional Education by Radio

By R. H. ECKELBERRY

THE Department of Education of Ohio State University, during the Autumn Quarter, is giving a course of instruction by radio on the subject "The School and Its Relations to the Community." This course began the week of October 1 and will end the week of December 17. The broadcasts are given from Station WOSU (570 kilocycles) and are available within a radius of about seventy miles from Columbus, and at greater distances for those who have the most sensitive receiving sets.

The broadcasts are addressed primarily to the teaching profession. They represent an attempt to make available to the schools of Ohio the best thinking of specialists with respect to various aspects of the problem of community relations. It is believed that they are of interest to laymen also. They are not to be confused with the broadcasts of the Ohio School of the Air, which are intended primarily for school pupils.

While this course carries no credit, it is as carefully organized as a regular course for students in residence. One phase or aspect of the general topic is dealt with each week in two broad-

casts at 9:00 to 9:15 P. M. on Wednesday and Friday nights, respectively. The Wednesday broadcast consists of a lecture on the problem of the week by a selected speaker. The Friday broadcast takes the form of a discussion of the problem by this speaker and two or three other persons, who have heard the Wednesday lecture.

The Wednesday lectures are given by specialists, selected largely, but not entirely from the Department of Education. Those participating in the Friday discussions include school superintendents, principals, teachers, business and professional men, and representatives of parent-teacher associations. A variety of points of view is thus represented.

A syllabus of this course has been prepared. It contains not only a full outline and names of lecturers, but also suggested readings and other aids for those who may wish to study more intensively the problems of the course. A copy of the syllabus will be sent on request.

The sponsors of the course request all those interested to secure copies of the syllabus and listen in on the broadcasts, but they believe that the greatest benefit can come only to those who actively participate. Hence, they request that, where practicable, listeners try out in their own communities the ideas presented by the various speakers and report their results by letter to the Department of Education. All such letters will receive prompt consideration and reply. The sponsors also suggest the desirability of forming local groups for the discussion of these problems. The Department of Education will be glad, if requested and so far as its resources of personnel and money allow, to send one of its members to participate in any local discussion of this kind.

Critical comment is requested concerning the organization of the course, the effectiveness of the various speakers, the choice of topics for future courses of this kind, or any other relevant matter. All communications should be addressed to the Department of Education, Ohio State University.

Ability Grouping: the Problem Reopened and Redefined

By HORACE B. ENGLISH

IN THE early days of intelligence testing, eminent psychologists committed themselves to extravagant programs which are still remembered against them. One of these was the notion of "homogeneous grouping." How a psychologist, of all people, and an educational psychologist at that, could use such a phrase must remain a mystery. Like the "purple cow" of the nonsense rhyme, I have never seen a homogeneous group; I never hope to see one. However you group children, scientifically or unscientifically, by guess or by test, by intuition or by rule, the one sure thing is that the pupils will remain individually unique and different.

Lately the much sounder expression, ability grouping, has gained acceptance. But ability has been again too narrowly conceived in terms of intelligence as measured by tests or of school "achievement," or of some combination of these two. Now, it is hardly to be questioned that ability as thus defined is a primary factor in a child's adjustment to the schools, not only of today but as they will be when progressive (or Progressive) educators shall have remodeled them. In practice, however, grave difficulties have been encountered. Trait differences, that is the difference from ability to ability within the single individual, have proved almost as great and far more troublesome than the differences between individuals. In despair, many educators have concluded that only by having groups of one pupil each can we really adjust to abilities.

There is no need here to speak of either the administrative or the pedagogical objections to such a completely individualized program. It is clearly the counsel of despair, and so far as I am aware no one has actually proposed it for our schools. Certainly no school practices it.

The failure of ability-grouping, however, or at least its failure to come up to the roseate expectations of its advocates, is due in part to a vagueness in the conception of ability. Ability is, of course, always relative. Ability for what? "Ability to do school work?" But this starts us off on the wrong foot. It envisages the child as on trial for his capacity to meet the exigen-

cies of the school. The ends of education are lost from sight. Surely, what we need to think about is the ability of the child to profit to the maximum from the total educational situation. Since we shall undoubtedly cause this child to be associated in some sort of formal way with other children, we must ask ourselves what sort of grouping will best promote his total development—whether that development is actually manifested or even attained in schoolroom, playground, street, or home.

With the question asked in this way, we need no longer think in terms of fixed and inflexible grades with supposedly fixed standards. But if, alas, through community ignorance or administrative sloth such fixed grades dominate the school system, we have still a rational criterion in line with the real ends of education whereby to judge how best to arrange some, at least, of the conditions under which John or Mary shall associate with their fellows.

IN THIS sense, I take it, everyone believes in ability grouping. But a term which covers everything or everybody is generally of little use. Accordingly, I feel sure that this one will presently find its way into whatever limbo awaits outmoded terminology. At the moment, however, it still serves a purpose, for it strikingly calls attention to the fact that, although we all believe in ability grouping, we do nothing about it—or at least too little. We continue to group children according to the most mechanical and arbitrary of all possible bases, that of age from birth. That for many children, perhaps, for most, this works well enough is, of course, the answer of sloth. We dare not be satisfied till we have secured for every child that combination of associations with his fellows which is most fruitful for him in the light of all his abilities, all his attitudes, all his traits of personality. This is not easy. It requires detailed knowledge of not only the child to be grouped, but the other children with whom he is to be associated. Equally clearly, it calls for a flexibility of administrative arrangements and a flexibility and imagination of teaching which is literally nowhere yet attained. Until we have more clearly seen and more honestly striven for these ends, the term ability grouping may serve with others to remind us of our supreme duty to the individual child.

EDITORIAL COMMENT

Bureau Services

THE Bureau of Educational Research has eleven types of service which are used by the schools of Ohio, and the beginning of the school year is an appropriate time to review them.

The Testing Service under Mr. R. W. Tyler and Mr. James E. Wert furnishes advice concerning the preparation of tests, the tests to use in specific situations, and the interpretation of tests that have been given. A monthly review of new tests is given in the EDUCATIONAL RESEARCH BULLETIN.

The Appointments Service under Mr. E. W. Anderson provides credentials of enrolled teachers about whom school officials may wish to inquire, nominates teachers for public schools and colleges upon request, and carries on investigations in teacher personnel.

The Survey Service under the direction of Mr. T. C. Holy conducts surveys for the public schools and other educational institutions of Ohio. This division is able to advise about general school surveys, new building requirements, remodeling old buildings, equipment, teachers' salaries, special levies, bond issues, and other financial problems.

The Personnel Service of the Bureau under Mr. W. H. Cowley is prepared to assist in making pupil-personnel surveys in high schools and colleges and in setting up guidance programs. It provides a consulting service for administrators who wish to manualize administrative routines.

The Reference Service maintains the library of the Bureau of Educational Research, the most completely catalogued educational reference library of its kind in the United States. Under Miss Ruth Seeger it is prepared to provide bibliographies on special subjects and to assist in running down materials used in investigations. Investigators may study in the library. It also has a collection of current elementary and high-school textbooks kept up to date by the publishers.

The Publications Service under Miss MacLatchy provides the EDUCATIONAL RESEARCH BULLETIN without cost upon request; the *Journal of Higher Education* at three dollars a

year; "Bureau of Educational Research Monographs" at cost; and advice to authors about the mechanics of publication.

The Curriculum Service under Mr. Charters and Mr. Dale will assist persons interested in curriculum revision in schools and colleges, and will provide bibliographies on curriculum problems.

The Radio Education Service temporarily under Mr. Charters answers inquiries concerning the use of radio in the schools.

The Motion-Picture Service under Mr. Dale provides consultation service concerning motion-picture discrimination and appreciation, current films suitable for children, and information concerning strictly educational films.

All members of the staff are available to give assistance in setting up controlled experiments and securing evidence about educational procedures. This service is supplied to public-school teachers, university and college professors, and graduate students.

Members of the staff are available at the cost of traveling expenses for speaking engagements in Ohio within the limits of the time at their disposal.

W. W. C.

Allow Us to Introduce

THREE new publications have come to the editor's desk within the last month. *Childhood Interests*, a digest for parents and teachers, made its first appearance in June of this year. Each issue carries this formal dedication: "*Childhood Interests* is dedicated to the privilege of helping to break down limitations of both parents and children, to inspire them to dare and to do things, to live richer, fuller lives, and to be busy happy people." Since it is a digest it reprints many articles from magazines and newspapers, but prints them in its own tasteful form—for this magazine is set in an attractive, even a distinguished, format; and it includes as well some articles written especially for its use. The sympathetic fashion in which the problems of childhood are presented will do much to break down the limitations which debar the parent from understanding the child's point of view and to bridge the gulf of misinterpretation which separates the child from his elders. In the October issue a new service, the evaluation of current motion pictures, in three classifications for intelligent adults, for youths, and for children, is added.

Childhood Interests is incorporated as an educational foundation endowed by The Book House for Children. The magazine appears monthly. The yearly subscription is $2.

"69 Bank St." is a lithoprinted "informal medium of exchange." It proposes to "contain a carefully edited, but highly current series of notes, less formal even than magazine articles," notes embodying the ideas, problems, and research still in process in the City and County School of New York and the eight co-operating schools. The first issue is devoted chiefly to a long editorial by Lucy Sprague Mitchell, "Teaching Past and Present," a report of the informal discussions on curriculum by teachers of nine- and ten-year-old children, to which is appended the bibliography of source materials used by the members of the group.

This pamphlet which is to present "current notes about children, curriculum, and research for teachers and parents" is distributed by the Co-operative School for Student Teachers, the Harriet Johnson Nursery School, and the Bureau of Educational Experiments. Subscriptions have been paid, for they are mentioned, but the amount of a single subscription is not stated. I am sure that even teachers who dare not claim to be "progressive" will want to receive the subsequent issues of this publication as they appear.

Social Frontier, a journal of educational criticism and reconstruction, edited by George S. Counts, made its first appearance in October. Speaking as chairman of the Board of Directors, William H. Kilpatrick says: The founding of *The Social Frontier* is "definitely related to the new spirit of creative social inquiry which has been apparent among American educators and teachers during the past three or four years. If the hopes of its founders are to be realized, this new journal must become the expressive medium of those members of the teaching profession who believe that education has an important, even strategic rôle to play in the reconstruction of American Society." The first issue contains extensive editorial comments; book reviews; two pages of clippings from magazines and newspapers; and articles by John Dewey, Charles A. Beard, Henry P. Fairchild, Sidney Hook, Goodwin Watson, and Nathan Ruch. Its pleasing appearance reminds one of its less aesthetic forerunners, *The Nation* and the *New Republic*.

J. MacLatchy

READINGS

GROSS, ALINE E. "A Preprimer Vocabulary Study," *Elementary School Journal*, XXXV (September, 1934), pp. 48–56.

The author analyzed some commonly used preprimers, all with copyright dates of 1927 or later, to find the actual vocabulary and the frequencies of each word contained in preprimers now on the market. All variants except possessives were counted separately; possessives were counted with the singular of the words. All proper names were included. Every word was counted, even in the titles and directions. The combined vocabulary of the ten preprimers was 393 words, and 8,831 words of reading material. All words with the same frequency were grouped together in the ranking. Each frequency group was then numbered: the highest, 413, ranked 1; the lowest, 1, ranked 86.

Such a word list may be used as a basis for drill, but it should not dominate the reading situation. The writer used it as a guide, to know what should be taught in order that children might be successful when they started to read from books. A record of each child's progress was kept, and, when the majority of the words had been introduced and had become practically automatic, many preprimers were read by the children at their own speed. Their mastery of vocabulary gave them a feeling of success, and "When a feeling of success accompanies the introduction of books, a long step has been taken toward making reading a joyful experience."

EDGERTON, A. H. "Keeping Guidance Programs Flexible, *Nation's Schools*, XIV (August, 1934), pp. 31–37.

Seven major guidance services are discussed in this interesting article: determining what opportunities there are; testing individual fitness for specific opportunities; making detailed case studies of pupil qualifications; assisting pupils in evaluating personal, educational, and occupational data; helping individuals adequately to prepare for chosen occupations; aiding individuals in securing employment; and helping them succeed in their work through follow-up services. The author points out the need for a continuous appraisal of guidance services, in view of the rapidly changing conditions affecting employment opportunities.

WILTSHIRE, HELEN. "Informational Content of Children in the First Four Grades," *Psychological Clinic*, XXII (September-November, 1933), pp. 198–207.

This study reports a standardization of a series of information questions given orally to four hundred children in the first four grades of schools in the rural districts of Hamilton County, Ohio, and at Cincinnati. The test used was the Scaled Information Test, Form A, devised by Lowe and Shimberg, published by C. H. Stoelting and Company, and standardized in written form for Grade IV through college.

The results were that the ability to answer certain information questions increased by grade in both the rural and urban groups, with the urban pupils

having a slight advantage. A sex difference was evident in favor of the boys in all grades, more pronouncedly in the third and fourth grades. There was also apparent an increase of informational content, as measured by this scale, with chronological age. The boys were ahead at all ages, more noticeably at the upper ages nine and ten years, though this lead did not seem to be consistently progressive with age. If compared on an age basis, the urban children also showed a slight lead over the rural. The overlapping of the rural and urban groups was so great as to minimize the significance of the difference between the means. This was evident both in the age and grade distributions. The difference in the age means of the sexes was also minimized through the factor of overlapping.

REEDER, C. W. "Should Increases in Grades Follow Increases in Intelligence Test Scores?" *School and Society*, XL (September 22, 1934), pp. 399–40.

Each entering class in the College of Commerce at the Ohio State University has scored higher than its predecessor on intelligence tests from the years 1931 to 1933, inclusive. The gain in scholarship marks, however, has been appreciably less than the gain in intelligence-test results. Possible reasons suggested by the author are: increased educational standards, fixed mark patterns, grading on the class average, students' attitudes, and the inefficient teaching of brilliant students.

MURPHY, MILES. "The Relation between Intelligence and Age of Walking in Normal and Feeble-minded Children," *Psychological Clinic*, XXII (September-November, 1933), pp. 187–97.

It has been generally recognized that feeble-minded children are retarded in beginning to walk. Mr. Murphy studied the age of walking in a feeble-minded and in a normal group from the same clinic population, and investigated the relationship between intelligence and age of walking in each group. The study was based upon the records of children examined in the Psychological Clinic of the University of Pennsylvania from January 1, 1926, to June 30, 1932.

The conclusions were these:

> The mean age of walking in 362 feeble-minded children was 26.65 months; in 350 normal children, 14.99 months. The correlation between age of walking and intelligence quotient was $-.19$, $\pm.035$ for the normal group, and $-.23$, $\pm.04$ in 254 feeble-minded cases for whom intelligence quotients were available. Normal children not walking before eighteen months are significantly inferior in intelligence quotient to those walking before that age. Idio-imbeciles are significantly later in walking than the less pronounced degrees of mental deficiency.

POTTER, GLADYS L. "Certain Attitudes of Elementary Children toward Motion Pictures," *California Journal of Elementary Education*, III (August, 1934), pp. 8–22.

This article indicates clearly that the State Department of Education of California, under the able leadership of Mr. Vierling Kersey, recognizes the importance of the out-of-school activities of the child. This study presents data regarding the motion-picture attendance of elementary-school children and their likes and dislikes as far as motion-picture entertainment is concerned.

Two facts stand out: the dislike that children have of horror pictures and their enjoyment of Mickey Mouse.

UPDEGRAFF, HARLAN. "Progress in American Public Schools," *Nation's Schools*, XIV (August, 1934), pp. 17–20.

In a meaty but brief survey of trends in education over a ten-year period ending in 1930, the author reports longer terms, better attendance, wider curriculums, improved buildings and equipment, and, in general, a surprising advancement in educational opportunities made during the decade.

"Aids to Teaching in the Elementary School," *Bulletin of the Department of Elementary School Principals*, XIII (June, 1934), pp. 117–528.

Every elementary-school principal ought to have this thirteenth yearbook in his library and utilize it frequently in teachers' meetings. This yearbook will satisfy the teacher who is looking for something that will tell her what to do, as well as the theorist who is concerned with the general principles back of the use of teaching aids. I forecast a wide sale and use for this periodical.

GREENE, HARRY W. "The Present Status of Negro Doctorates," *School and Society*, XL (September 22, 1934), pp. 388–89.

In the past fifty-eight years 107 negroes have been granted Ph.D. degrees from American and European universities. Sixteen such degrees were awarded in 1933–34 and 61 during the past four years. Political science (24), physical sciences (18), and biological sciences (17) are the leading major fields of preparation.

In Paper Covers

CUNNINGHAM, K. S., AND OTHERS. *Australian Educational Studies.* Melbourne, Australia: Melbourne University Press, 1932. 125 pp. (Educational Research Series, No. 14)

Diverse subjects are dealt with in this collection as is shown by the section headings: the length of the teacher's professional life, an experiment in reading comprehension, standardized tests of teaching ability, problem children in Melbourne schools, crippled children in Tasmania, and the story of an Australian nursery school. While the findings of the first, fourth, and fifth studies are of local value only, and some of the situations faced in the second and third studies are not similar to those we have in the United States, the techniques used to secure the data may be of interest.

VIVIAN WEEDON

BOOGHER, ELBERT W. G. *Secondary Education in Georgia, 1732–1858.* Philadelphia, Pennsylvania: University of Pennsylvania, 1933. vii+452 pp.

This study covers the period from the granting of the charter which led to the first permanent English settlement of Georgia to the end of the pre-Civil-War era. While he is concerned primarily with secondary education, and gives most space to the academy, the author naturally and necessarily gives attention also to elementary and higher education. The topics covered include: the historical background, early educational beginnings, constitutional

and legislative provisions, growth of academies, character of the academies, female secondary education, and religious influence and denominational schools. Among the most valuable features are the appendixes, which fill some 170 pages and which include, in addition to the bibliography, reprints of numerous school advertisements, lists of academies in Georgia by decades and counties, abstracts of academy reports to the Senatus Academicus, and textbooks used in Georgia schools.

The author has utilized an enormous amount and a great variety of source material. He has produced a thorough and scholarly piece of work such as we have come to expect from the students of Thomas Woody, and his monograph is notable for the completeness of the data rather than for their interpretation in terms of large movements and important ideas.

R. H. ECKELBERRY

McGUIRE, SAMUEL HARRISON. *Trends in Principles and Practices of Equalization of Educational Opportunity.* Nashville, Tennessee: George Peabody College for Teachers, 1934. xiii+115 pp. (Contributions to Education No. 121)

This study has been predicated upon the theory that public support for schools depends upon the aims of public education. The author deals more with the general state plans of equalization, of which many have been changed since the data were collected, than with what opportunities should be provided by the funds expended. The treatment of equalization is an excellent analysis of the work which has been done in attempting to guarantee educational privileges to the children residing within the separate states resorting to some form of aid to the financially weak school districts.

While the study implies that the more recent tendency is a broader program of equalizing school costs, it fails to distinguish between the equalization of school costs and the state support of a foundation school program. This is confusing to the reader. Moreover, the assumption is held in the study that equalized educational opportunity is a subsequent corollary to equalized school cost. This book provides basic material for a more valuable analysis in the field of school finance, namely, the difference between the principles underlying the equalization of school costs and the support of a foundation school program.

D. H. SUTTON
State Department of Education

HAWKINS, MASON ALBERT. *Frederick Douglass High School: A Seventeen-Year Period Survey.* Philadelphia, Pennsylavnia: University of Pennsylvania, 1933. xxiv+203 pp.

A survey covering a period of seventeen years is to be commended for its sufficiency to indicate trends as well as to set forth present conditions. This one is exceptional in this regard, and in the fact also that it deals with a public high school for colored youth.

The work appears, from the opening sections, to have been approached from a substantial background of familiarity with both secondary-school history and modern educational theory. Statistical data are full, well organized, largely converted into graphical forms of representation, and well interpreted.

There is commendable absence of assertion not fully justified by the discovered facts. The following features of the school are fully covered: population, management and instruction, curriculum and curriculum practices, promotion and non-promotion, and occupational status of parents.

Along with the advantage accruing to the school staff from a comprehensive study of its own problems, some loss necessarily has been sustained in the way of the more searching type of criticism which ordinarily issues from the wider, more penetrative view of the practiced surveyor.

T. C. LANDSITTEL

ALLEN, HOLLIS P. *Universal Free Education.* Palo Alto, California: Stanford University Press, 1934. v+100 pp.

This book presents an excellent treatise on the factual information showing that the development of our public educational scheme has been the handmaiden of social trends. It applies only to the program of free education provided in the elementary and secondary schools. The analysis includes such problems as the motive and extent of school attendance, the status of compulsory-attendance laws, proposed retrenchments in the free educational program, the economy of education in a representative democracy, an economical program of compulsory education, and the economy test of universal free education.

The author presents a clear, straightforward analysis of the need for education which definitely maintains that the educational program is the result of social trends. The distinguishing differences between economy and retrenchment are clearly shown. This book is a challenge to educators who are planning a school program. It indicates where economies may be made on the basis of sound judgment, and it demands strict adherence to a program which functions in terms of modern problems. Every progressive school leader should welcome this publication.

D. H. SUTTON
State Department of Education

Books to Read

SEELY, HOWARD FRANCIS. *On Teaching English.* New York: American Book Company, 1933. xix+391 pp.

Seldom is it possible to pick up a book so thoroughly interesting to read, so interestingly written, and so coherent as to purposes, materials, and methods as is *On Teaching English.* In a period given over in the educational field to backward and forward looks, a book unaffectedly demonstrating more valid methods, more informally useful materials, and a psychologically and logically sound philosophy demands attention. By showing specifically how the English teacher can function in consonance with the democratic philosophy, it also demonstrates the philosophy's applicability to other subject-matter fields since any teacher who uses language, who is interested in the developing thought processes of his pupils and their increasing capacity fully to express those thoughts, is of necessity a language teacher.

The book naturally falls into three major sections. "The Fundamentals," through concrete discussion, brings specific meaning to functional and developmental usage. In "Oral Composition" the vocalization of thought is made

practical and interesting to the pupil throughout his school life. "Written Composition" brings into the open for what appears to be the first time the reason why anyone writes, and makes obvious the ways in which teachers can most wisely stimulate and improve student writing. Finally, drawing the three sections together illustratively, Mr. Seely presents some eighty pages of sample pupil writing fully exemplifying standards that any teacher might well expect to reach from such an intelligent and workable system of composition teaching.

GEORGE H. MCCLELLAN

NASH, J. B., editor. *Physiological Health.* New York: A. S. Barnes and Company, 1933. viii+308 pp.

This is the fourth volume of the series, "Interpretations of Physical Education," edited by Jay B. Nash, and published by the School of Education, New York University. Contributions have been made by some twenty-seven authorities drawn from varied fields of health activities. An interesting departure is the "personalia" at the beginning of each contribution—a sort of "who's who."

Beginning with the ubiquitous attempt to define health, the volume discusses the forces and factors in building and maintaining health from nine different viewpoints. Upon this groundwork there is built a philosophy of health as a basic potential for full development. This leads to an examination of the teaching and administration for health.

The key to the usefulness of a volume of this nature lies in the statement of the editor that "teaching for health is a broader term than teaching physical education" and "the program of health co-ordination in a school should tie all the contributions of the institution into one constructive plan for the realization of the objective health." There is a satisfactory bibliography but no index.

R. G. PATERSON
Ohio Public Health Association

COOKE, DENNIS H. *Problems of the Teacher Personnel.* New York: Longmans, Green and Company, 1933. xv+384 pp.

Well written and very readable is Mr. Cooke's recent book presenting to teachers and to superintendents the basic facts and numerous problems in the field of teacher personnel. The teacher should get from this book a rather clear understanding of what is and what should be his status. School executives should get a number of valuable suggestions to help them in the administration of teacher personnel.

To the reviewer, the chapters on psychological factors and the measurement of teaching efficiency were most interesting. Some of the interesting conclusions are that the number of graduates of the teacher-training courses will far exceed the demand for teachers for a number of years; that at present we are rapidly approaching a minimum training of four years of college for all high-school teachers and of two years of college for all elementary-school teachers; that the present trend is toward an equal amount of education for elementary- and secondary-school teachers; that we should have equally good teachers for city- and rural-school pupils; and that inadequately trained teach-

ers should be replaced by those who have the necessary training. If the last statement means that as untrained teachers drop out of the profession their places should be filled by trained teachers, or that untrained teachers should be required to advance toward adequate training, then to this statement the reviewer would agree.

If it means that all members of the present staff who are inadequately trained should be dropped from their positions and their places given to adequately trained even though inexperienced teachers, then the reviewer would question seriously whether successful experience may not be worth more toward adequate teaching efficiency than sufficient training unaccompanied by successful experience. In other words, the inexperienced, trained teacher in many instances is not so superior a teacher as the experienced, less well-trained teacher. We must remember that learning to teach is not all gained in the training school. However, the well-trained, successfully experienced teacher is usually of more value to the school system than one inadequately trained. This book is a real contribution to the educational literature. It should be of great help to teachers and superintendents. It is well written and well organized.

EARL W. ANDERSON

LACKEY, EARL E. *Introductory Geography for Teachers'-College Students.* Lincoln, Nebraska: The author, 1933. viii+124 pp.

This book is an excellent thesis on a "method of selecting and evaluating materials for a professional subject-matter treatment" of the principles of geography. It has paragraphs approaching brilliance lost among descriptions of methodology of a statistical approach to the truth. The professional educationalist will read it with admiration, but the geographer will wish that the author had discarded the framework of the method of procedure and had given us his conclusions in literary form. He should have explained his philosophy, not his procedure of thought. The book remains, however, an excellent work and, if one is willing to wade through the tables, there is meat, much meat, between the bones.

RODERICK PEATTIE

WAGONER, LOVISA C. *The Development of Learning in Young Children.* New York: McGraw-Hill Book Company, 1933. xiv+322 pp.

Miss Wagoner has succeeded in her aim to "present some of the steps by means of which the child acquires the skills and methods of response which will enable him to function satisfactorily in collaboration with other human beings." The presentation is descriptive rather than theoretical, and makes clear how children learn with little reference to any "laws of learning." Numerous illustrative examples are taken from the observation of nursery-school children. Most controversial questions are avoided. Freud and Adler, for example, appear to have been ignored. Left-handedness and member dominance are not discussed. The advantages and disadvantages for satisfactory learning in the nursery school as compared with the home are not enumerated. The parallel relation between maturation and training in the learning and development of young children is treated most acceptably.

Though not a handbook for parents set up in didactic form, the book should be helpful to parents as well as to those in charge of nursery schools

and kindergartens. It has the advantages of being readable and interesting, as well as being acceptable as a descriptive text in dynamic child psychology.

FRANCIS N. MAXFIELD

WRIGHTSTONE, J. WAYNE. *Stimulation of Educational Undertakings.* New York: Teachers College, Columbia University, 1933. x+76 pp. (Teachers College, Columbia University, Contributions to Education, No. 562)

The author makes a comparison of earmarked and non-earmarked funds in the state of New York in two five-year periods. The periods were 1922–26 inclusive, and 1927–31 inclusive. The investigation is a comparison of the Updegraff (1922–26) and the Mort (1927–31) plans of state aid as they had operated in New York state. The Updegraff plan is characterized as the "reward of effort," and the Mort plan as "equalization." Fifty-six cities in New York state are studied. New York city was not one of the group. The investigation does not show one plan superior to the other. Stress is given to local initiative. The conclusion is that earmarked funds are better if local leadership is poor, and that non-earmarked funds are better if local leadership is strong.

G. D. HUMPHREY

LUMLEY, FREDERICK E. *The Propaganda Menace.* New York: Century Company, 1933. ix+454 pp.

Mr. Lumley has made a most valuable contribution to the liberation of human intelligence by pointing out and tracking down the chief menace to true progress, propaganda. The book should be in every library and in the hands of every student of human affairs as an introduction to the literature on this vital problem.

The author investigates the very peculiar way in which man promotes the nonmaterial parts of his culture, namely, the habits and ideas which govern the use of his crops and tools. The present conflict between those favoring education and those pushing propaganda as the means of forming habits and ideas is analyzed. The various conceptions of propaganda are summarized, and the existence of propaganda from most primitive times is proved. Propogandists are investigated as to interests, methods, content, and results, with the dispassionate accuracy of a Robert Koch turning his microscope on harmful microbes. The limitations to propaganda are noted. The author suggests that the basic remedy is liberal education centering on how we think, not on what we think. We must have the liberation of intelligence from the dead hand of the past so that we may use our immense wealth and boundless energy to create the abundant life for everyone. The menace of propaganda must be outfaced, and this book is a sturdy weapon for that purpose.

ARTHUR HENRY MOEHLMAN

NEW TESTS

Tests of reading readiness have not cleared from the school stream the obstructions of reading difficulties. Indeed, to one interested in the problem, the number of children with reading difficulties seems to be increasing, although reading likely was never taught so well and so extensively as now. A continually perplexing problem to the research worker is the recurring experience with the upper-grade child who has never learned to read, but who with careful direction can attain the reading proficiency required at his grade-level after months, instead of years, of effort. This child's difficulties may have been caused by some inability of his eyes to focus or co-ordinate when he entered school—an inability which he has now outgrown. Such a possibility is worth investigating.

Perhaps through the use of the Keystone Ophthalmic Telebinocular and the Betts Ready to Read Tests such potential reading-difficulty cases now entering school may be detected. The possibility is worthy of serious examination by every school administrator. The Keystone Ophthalmic Telebinocular is a machine-age version of the stereoscope found in the parlors of all well-equipped grandmothers in the nineties. The telebinocular is a sturdy instrument with a tiny electric light which illuminates the slide to be viewed by the subject. It is provided with a calibrated shaft by which the examiner can simulate reading distances, varying from infinity to normal reading distance, by changing the points at which the slide is viewed.

The visual-sensation and perception slides of the Betts Ready to Read Tests provide a means of testing a young child's powers and habits of vision by simple pictures which he can readily interpret to the examiner. The slides provide tests of binocular acuity, right-eye and left-eye acuity, depth perception, vertical and lateral imbalance, binocular vision, and far-point and near-point fusion. The keeping of the child's record is explained and the method of interpretation is provided in the excellent "Manual of Directions" which accompanies the tests. The tests have been standardized using the records of two thousand children and young men and women.

The oculomotor and perception slides provide a series of tests by which the child's habits of perception and monocular and binocular reading tendencies may be determined, under conditions resembling those he encounters in reading, as well as serving as a diagnostic instrument by which the type of remedial instruction needed may be decided upon. Mr. Betts has completed a survey instrument for use with six-year-olds by including tests of visual readiness (letter forms and word forms) and of auditory span and fusion.

The tests were devised by Mr. Emmett Albert Betts while Director of the Reading Clinic, Shaker Heights, Ohio. He conferred with eye-specialists and other doctors in his search for truly diagnostic instruments, and has been ably assisted in the final arrangement of his materials by the Bureau of Research of the Keystone View Company, Meadville, Pennsylvania, the manufacturers of the telebinocular and publishers of the tests.

J. MacLatchy

A Work-Test Book to accompany the new edition of *Biology and Human Welfare* has recently been constructed by J. E. Peabody and published by the Macmillan Company. The work book consists of many completion exercises which are to be filled in by the student. The behavior required of the student is mainly the recall of information concerning various phases of botany and zoölogy and other aspects of human welfare. Unfortunately, it does not provide exercises in which the student can apply the knowledge of biology in solving new problems; this is one important objective of high-school biology teaching. It does not provide instruction nor practice exercises in drawing reasonable inferences.

The last six pages are provided for the student to record important facts about himself. The questions asked should focus attention on desirable personal characteristics. It gives him practice in self-analysis and self-judgment. For example, the following questions are asked: "When confronted by an uninteresting and disagreeable task, are you a 'self-starter,' or must you be urged or driven?" "In your studies are you working primarily for high marks or because the subject is worth working on?" "What vocation in life do you most desire to enter?"—These and other significant questions are raised.

F. P. Frutchey